REMARKS

Applicants intend this response to be a complete response to the Examiner's **26 October 2006** Final Office Action. Applicant has labeled the paragraphs in his response to correspond to the paragraph labeling in the Office Action for the convenience of the Examiner.

Claim Rejections - 35 USC § 102

Claims 26-33 stand rejected under 35 U.S.C. 102(b) as being clearly anticipated by Rounbehler et al(5808178).

The Examiner contends as follows:

> Rounbehler et al teaches a method for improving separation efficiencies comprising the step of providing a gas chromatography apparatus comprising a microwave oven adapted to heat the GC column and including a GC column having a continuous phase material(105) forming a wall surrounding an interior space for containing a chromatography sample and a microwave absorbing material contained in the continuous phase material(column 13 lines 39-40), a microwave source, a temperature sensor , and a microwave source controller adapted to control a microwave power to the microwave oven by the microwave source and to control a power efficiency of the microwave source, a coolant source, and a coolant source controller adapted to control a flow rate of the coolant, and irradiating the GC column with microwave energy at a controlled irradiation rate sufficient to produce a positive temperature ramp, where a lower start temperature is raised to a higher stop temperature, and supplying a coolant to the GC column at controlled rate sufficient to produce a negative temperature ramp, where a higher start temperature is lowered to a lower stop temperature(figure 17), where the negative temperature ramp improves the separation of lower boiling components from higher boiling components or improves the separation of components having boiling points within a narrow temperature range. Rounbehler et al further teaches holding the GC column at each higher stop temperature for a positive ramp hold time and at each lower stop temperature for a negative ramp hold time by supplying a coolant to the GC column and irradiating the GC column with microwave energy under temperature maintaining conditions.

Applicants have canceled **Claims 26-33** rendering this rejection moot.

Claims 34-40 stand rejected under 35 U.S.C. 102(b) as being clearly anticipated by Rounbehler et al(5808178).

The Examiner contends as follows:

> Rounbehler et al teaches a method for improving separation efficiencies comprising the step of providing a gas chromatography apparatus comprising a microwave oven adapted to heat the GC column and including a GC column having a continuous phase material(105) forming a wall surrounding an interior space for

containing a chromatography sample and a microwave absorbing material contained in the continuous phase material(column 13 lines 39-40), a microwave source, a temperature sensor , and a microwave source controller adapted to control a microwave power to the microwave oven by the microwave source and to control a power efficiency of the microwave source, a coolant source, and a coolant source controller adapted to control a flow rate of the coolant, and irradiating the GC column with microwave energy at a controlled irradiation rate sufficient to produce a positive temperature ramp, where a lower start temperature is raised to a higher stop temperature, holding the GC column at a higher stop temperature for positive ramp hold time by supplying a coolant to the GC column and irradiating the GC column with microwave energy under temperature maintaining conditions, supplying the coolant to the GC column at a controlled flow rate sufficient to produce a negative temperature ramp, where a higher start temperature is lowered to a lower stop temperature, holding the GC column at a lower stop temperature for a negative ramp hold time by supplying a coolant to the GC column and irradiating the GC column with microwave energy under temperature maintaining conditions, where the negative temperature ramp and negative ramp hold time improves the separation of lower boiling components from higher boiling components or improves the separation of components having boiling points within a narrow temperature range.

Applicants have canceled **Claims 34-40** rendering this rejection moot.

Claims 41-48 stand rejected under 35 U.S.C. 102(b) as being clearly anticipated by Rounbehler et al(5808178).

The Examiner contends as follows:

Rounbehler et al teaches a GC separation protocol method for a microwave heated GC apparatus comprising the steps of providing a gas chromatography apparatus comprising. a microwave oven adapted to heat the GC column and including a GC column having a continuous phase material(105) forming a wall surrounding an interior space for containing a chromatography sample and a microwave absorbing material contained in the continuous phase material(column 13 lines 39-40), a microwave source, a temperature sensor , and a microwave source controller adapted to control a microwave power to the microwave oven by the microwave source and to control a power efficiency of the microwave source, a coolant source, and a coolant source controller adapted to control a flow rate of the coolant, and applying at least one positive temperature ramp to the GC column , and applying at least one negative temperature ramp to the GC column , where the negative temperature ramp and negative ramp hold time improve the separation of lower boiling components from higher boiling components or improves the separation of components having boiling points within a narrow temperature range.

Applicants have canceled **Claims 41-48** rendering this rejection moot.

Claims 49-55 stand rejected under 35 U.S.C. 102(b) as being clearly anticipated by Rounbehler et al(5808178).

The Examiner contends as follows:

> Rounbehler et al teaches a GC separation protocol method for a microwave heated GC apparatus comprising the steps of providing a gas chromatography apparatus comprising a microwave oven adapted to heat the GC column and including a GC column having a continuous phase material(105) forming a wall surrounding an interior space for containing a chromatography sample and a microwave absorbing material contained in the continuous phase material(column 13 lines 39-40), a microwave source, a temperature sensor , and a microwave source controller adapted to control a microwave power to the microwave oven by the microwave source and to control a power efficiency of the microwave source, a coolant source, and a coolant source controller adapted to control a flow rate of the coolant, and applying at least one positive temperature ramp to the GC column , and applying at least one negative temperature ramp to the GC column, where the positive temperature ramps are the same or different, applying one or a plurality of negative temperature ramps, where the negative temperature ramps are the same or different, holding a resulting GC column temperature after each positive or negative temperature ramp for one or a plurality of hold times by supplying a sufficient coolant flow and sufficient microwave energy under temperature maintaining conditions, where the hold times are the same or different, and where the negative temperature ramps and hold times improve the separation of lower boiling components from higher boiling components or improves the separation of components having boiling points within a narrow temperature range.

Applicants have canceled **Claims 49-55** rendering this rejection moot.

Allowable Subject Matter

Claims 18-25 are allowed.

The Examiner contends as follows:

> Claim 18 recites "a method for improving separation efficiencies comprising the step of : providing a gas chromatography (GC) apparatus comprising ... performing one or a second plurality of negative temperature ramps, where each negative temperature ramp comprises lowering a current temperature of the GC column from a higher start temperature or a second plurality of higher start temperatures to a lower stop temperature or a second plurality of lower stop temperatures at a negative controlled rate or at a second plurality of controlled rates". Rounbehler et al teaches a negative temperature ramp in figure 17, however the temperature ramp is an immediate drop instead of at a controlled rate. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide lowering a current temperature of the GC column from a higher start temperature or a second plurality of higher start temperatures to a lower stop

temperature or a second plurality of lower stop temperatures at a negative controlled rate or at a second plurality of controlled rates because Rounbehler et al does not suggest such a modification. Claims 19-25 depend on claim 18 and hence are also allowed.

Applicants acknowledge that **Claim 18-25** are allowed. Applicants notes that claim 14 also depends from Claim 18 and respectfully requests modification of the allowed claims to include claim 14.

Response to Arguments

The Examiner contends as follows:

Applicant's arguments filed 10-10-06 have been fully considered but they are not persuasive.

Applicant argues with respect to claims 26,34,41, and 49 that Rounbehler et al does not disclose a GC column comprising a continuous phase material forming a wall surrounding an interior space for containing a chromatography sample and a microwave absorbing material contained in the continuous phase material. Examiner respectfully submits Rounbehler et al clearly teaches a continuous phase material forming a wall(105 in figure 1) surrounding an interior space for containing a chromatography sample and a microwave absorbing material contained in the continuous phase material(column 13 lines 38-45). Therefore, Examiner respectfully submits Rounbehler et al clearly anticipates claims 26,34,41, and 49 which includes the above recited limitations.

Having fully responded to the Examiner's Final Office Action, Applicant respectfully urges that is application be passed onto allowance.

Applicants have attached a check in the amount of $2070 including a 3 month extension fee of $1020 and additional claim charges of $1050 ($50×21).

The Commissioner is authorized to charge any additional fees or credit any overpayments to Deposit Account Number 501518.

If it would be of assistance in resolving any issues in this application, the Examiner is kindly invited to contact applicant's attorney Robert W. Strozier at 713.977.7000

Date: **October 31, 2006**

Respectfully submitted,

Robert W. Strozier
Reg. No. 34,024

The PTO did not receive the following listed item(s) check